WHAT IS CLAIMED IS:

1. An isolated nucleic acid and the degenerate sequences thereof, which encodes human α1 chain collagen protein, comprising the nucleotide sequence set forth in SEQ ID NO. 5.

2. The nucleic acid as claimed in claim 1, wherein the human α1 chain collagen protein encoded by the nucleic acid has the amino acid sequence set forth in SEQ ID NO. 1.

3. The nucleic acid as claimed in claim 2, wherein the human α1 chain collagen protein comprises:

(i) von Willebrand factor A domain set forth in SEQ ID NO. 2;

(ii) thrombospondin N-terminal-like domain set forth in SEQ ID NO. 3; and

(iii) collagenous domain set forth in SEQ ID NO. 4.

4. The nucleic acid as claimed in claim 1, comprising DNA and RNA.

5. The nucleic acid as claimed in claim 4, wherein the DNA comprises cDNA and genomic DNA.

6. A human α1 chain collagen protein having the amino acid sequence set forth in SEQ ID NO. 1.

7. The human α1 chain collagen protein as claimed in claim 6, wherein the protein is encoded by the nucleic acid of claim 1.

8. The human α1 chain collagen protein as claimed in claim 7, comprising:

(i) von Willebrand factor A domain set forth in SEQ ID NO. 2;

(ii) thrombospondin N-terminal-like domain set forth in SEQ ID NO. 3; and

(iii) collagenous domain set forth in SEQ ID NO. 4.

9. A recombinant vector comprising the nucleic acid of claim 1 and a regulatory sequence.

10. The recombinant vector as claimed in claim 9, wherein the regulatory sequence comprises an operatively linked promoter.

11. The recombinant vector as claimed in claim 9, wherein the recombinant vector is designated Bluescript KS(+)/*E. coli* DH5α(*hCOLA1*) and deposited at the Culture Collection and Research Center (Hsinchu, Taiwan) and assigned accession number CCRC 940331.

12. A method for producing human α1 chain collagen protein, comprising the steps of:

(a) transforming or transfecting a host cell with the recombinant vector of claim 9;

(b) culturing said transformed or transfected cell under the conditions sufficient for expression of the human α1 chain collagen protein; and

(c) recovering and purifying the human α1 chain collagen protein.

13. The method as claimed in claim 12, wherein the host cell is selected from the group consisting of prokaryotic and eukaryotic cell.

14. The method as claimed in claim 13, wherein the prokaryotic cell comprises *Escherichia coli*.

15. The method as claimed in claim 13, wherein the eukaryotic cell comprises mammalian cell.

16. The method as claimed in claim 12, wherein the recovering and purifying step is conducted by column chromatography.

17. An isolated nucleic acid comprising at least 500 contiguous nucleotides in length derived from SEQ ID NO. 5 or a complementary nucleotide sequence thereto.

18. A kit for detecting the disease related to the mutation of SEQ ID NO. 5 in a mammal or human comprising a probe, which comprises the nucleic acid of claim 1 or claim 17.

19. An isolated nucleic acid comprising at least 20 contiguous nucleotides in length derived from SEQ ID NO. 5 or a complementary nucleotide sequence thereto.

20. A kit for detecting the disease related to the mutation of SEQ ID NO. 5 in a mammal or human comprising a primer, which comprises the nucleic acid of claim 19.